

REMARKS

The Applicants thank the Examiner for the thorough consideration given the present application. Claims 1, 3, and 4 were previously cancelled. Claims 2 and 5-15 are pending.

Claim 2 has been amended by adding “a shift register receiving and outputting image data of one of the three primary colors within the sub-frame corresponding to the one of the three primary colors”, “a gamma multiplexer outputting a gamma reference voltage corresponding to the one of the three primary colors within the sub-frame corresponding to the one of the three primary colors” and “the horizontal lines are sequentially scanned within each of the sub-frames”. Support for the amendment may be found in FIGs.5 and 6 and paragraph [0023] of the specification.

Claim 5 is newly added. Support for the new claim may be found in FIG. 6 and paragraph [0023] of the specification.

Claims 6-7 are newly added. Support for the new claims may be found in FIG. 2 and FIG. 3.

Claims 8-10 are newly added. Support for the new claims may be found in FIG. 2 and FIG. 4.

Claims 11-13 are newly added. Support for the new claims may be found in FIG. 2 and FIG. 5.

Claim 14 is newly added. Support for the new claim may be found in FIG. 2.

Claim 15 is newly added. Support for the new claim may be found in FIG. 6.

The Examiner is respectfully requested to reconsider the rejections in view of the amendments and remarks set forth herein.

Rejection under 35 U.S.C. 103(a)

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nose (US Pat. App. No. 2002/0163490) in view of Lee (US Pat. App. No. 2003/0132907) and in view of prior art taught by Nose.

Independent claim 2, as amended, recites a data driver of a display forming an image frame divided into three sub-frames respectively corresponding to three primary colors by sequentially scanning horizontal lines, the data driver comprising: a shift register receiving and outputting image data of one of the three primary colors within the sub-frame corresponding to the one of the three primary colors; a sample and hold register acquiring the image data from the shift register; a gamma multiplexer outputting gamma reference voltages corresponding to the one of the three primary colors within the sub-frame corresponding to the one of the three primary colors; a digital-to-analog converter for gamma calibration, receiving the image data from the sample and hold register and the gamma reference voltage from the gamma multiplexer, and outputting a calibrated image signal; and a buffer receiving the calibrated image signal from the digital-to-analog converter, wherein the horizontal lines are sequentially scanned within each of the sub-frames.

Nose does not teach, disclose or suggest a shift register receiving and outputting image data of one of the three primary colors within the sub-frame corresponding to the one of the three primary colors; a gamma multiplexer outputting a gamma reference voltage

corresponding to the one of the three primary colors within the sub-frame corresponding to the one of the three primary colors; and the horizontal lines are sequentially scanned within each of the sub-frames.

Nose (paragraph [0012], lines 1-7) describes “6 bits of R-color gray-scale data DR, 6 bits of G-color gray-scale data DG, and 6-bits of B-color gray-scale data DB all being fed from the display control circuit 13 are held, in parallel, in a data register section 164 being controlled by an output, which is controlled by a horizontal start pulse HSP and a clock signal HCK, fed at each stage in a shift register section 163”. Specifically, Nose only discloses that shift register section 163 and data register section 164 hold image data for three primary colors. However, Nose does not teach, disclose or suggest *a shift register receiving and outputting image data of one of the three primary colors within the sub-frame corresponding to the one of the three primary colors.*

Furthermore, Nose (paragraphs [0080-0082] and FIG. 2 and 3) describes “The gray-scale data input from the image writing device 100, as shown in FIG. 2, is made up of signals in which a set of gray-scale data being arranged in order of R, G, and B colors is repeatedly arranged from a pixel 1 to a pixel 640 in every scanning line position” and “The display control circuit 3 sorts the input gray-scale data in a manner as shown in FIG. 2 and outputs, sequentially and repeatedly, signals in which signals for the R color are arranged from the pixel 1 to the pixel 640, signals in which signals for the G color are arranged from the pixel 1 to the 640 pixels, and signals in which signals for the B color are arranged from the pixel 1 to the pixel 640 in every scanning line position to each of the scanning line positions 1 to 1440”

and "Each of the MPXs M1, M2, . . . , M9, and M10 selects a corresponding voltage in response to the selection control signal SL being output in synchronization with the selection of the scanning line 21 for each of the R, G, and B colors". Specifically, Nose only discloses that the reference gray-scale voltages for the R, G and B colors are fed by the RGB switching reference gray-scale voltage producing circuit 4 respectively to the scanning line positions for the R, G and B colors. However, Nose does not teach, disclose or suggest *a gamma multiplexer outputting a gamma reference voltage corresponding to the one of the three primary colors within the sub-frame corresponding to the one of the three primary colors; and the horizontal lines are sequentially scanned within each of the sub-frames.*

For this reason alone, claim 2 is patentable over the cited arts, and the rejection of independent claim 2 should be withdrawn. It is therefore Applicants' belief that independent claim 2 is allowable. Insofar as claim 5 depend from claim 2 and its related claims, they are also allowable.

New claims

The new claim 5 recites, in part, "the image frame comprises a first sub-frame corresponding to a first primary color of the three primary colors, a second sub-frame corresponding to a second primary color of the three primary colors, and a third sub-frame corresponding to a third primary color of the three primary colors, wherein the second sub-frame is subsequent to the first sub-frame and the third sub-frame is subsequent to the second sub-frame". Applicants believe that it is clear that the limitation is not taught by the cited reference.

The new claims 6, 8 and 11 recite, in part, "gamma multiplexer outputting gamma reference voltages for the three primary colors in the sequence of the time slots". Applicants believe that it is clear that the limitation is not taught by the cited reference.

The new claims 7, 9 and 12 recite, in part, "gamma multiplexer outputs the gamma reference voltages for a first primary color of the three primary colors within the time slot corresponding to the first primary color, the gamma reference voltages for a second primary color of the three primary colors within the time slot corresponding to the second primary color, and the gamma reference voltages for a third primary color of the three primary colors within the time slot corresponding to the third primary color". Applicants believe that it is clear that the limitation is not taught by the cited reference.

For the reasons as described above, Applicants believe that independent claim 2 is allowable over the cited references. Insofar as independent claim 2 is allowable, claim 5, all dependent from claim 2, including every claimed element thereof, are also allowable on their own merits in claiming additional elements not included in claim 2.

Furthermore, for the reasons as described above, Applicants believe that independent claim 6 is allowable over the cited references. Insofar as claim independent 6 is allowable, claim 7, all dependent from independent claim 6, including every claimed element thereof, are also allowable on their own merits in claiming additional elements not included in claim 6. Moreover, for the reasons as described above, Applicants believe that independent claim 8 is allowable over the cited references.

Insofar as independent claim 8 is allowable, claims 9-10, all dependent from claim 8,

including every claimed element thereof, are also allowable on their own merits in claiming additional elements not included in independent claim 8.

Furthermore, for the reasons as described above, Applicants believe that independent claim 11 is allowable over the cited references. Insofar as independent claim 11 is allowable, claims 12-13, all dependent from independent claim 11, including every claimed element thereof, are also allowable on their own merits in claiming additional elements not included in independent claim 11.

Furthermore, for the reasons as described above, Applicants believe that claims 14 and 15 are allowable over the cited references.

Withdrawal of the rejections and allowance of the claims, are respectfully requested. Applicants have made every effort to place the present application in condition for allowance. It is therefore earnestly requested that the present application, as a whole, receive favorable consideration and that all of the claims be allowed in their present form.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the Carl T. Thomsen, Reg. No. 50,786, at 1.703.208.4030 (direct line), to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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